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## MISCELLANEOUS.

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147. Proposed by F. P. MATZ, Ph. D., Sc. D., Reading, Pa.

If  $P$  be a point within the scalene triangle, such that  $\angle PAB = \angle PBC = \angle PCA = \phi$ , then  $\cot \phi = \cot A + \cot B + \cot C$  ..... (1), and  $\operatorname{cosec}^2 \phi = \operatorname{cosec}^2 A + \operatorname{cosec}^2 B + \operatorname{cosec}^2 C$  ..... (2).

NOTE.—Problems and solutions in the departments of Geometry, Calculus, Mechanics, and Average and Probability should be sent to B. F. Finkel; and those in the departments of Algebra, Diophantine Analysis, Miscellaneous, and Group Theory should be sent to Dr. Saul Epstein. Our contributors should carefully observe this notice if proper credit for contributions is to be given.

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## NOTES.

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A list of one hundred mathematical models, made and for sale by Mr. R. P. Baker, 5519 Monroe Street, Chicago, Ill., has recently been issued. The models relate to solid geometry, linkages, crystallography, twisted cubics, cubic cones, scrolls, surfaces of the second order, etc. In view of the numerous orders received, Mr. Baker expects to devote his entire attention to the construction of models. D.

F. Strobel of Jena, has compiled a directory of all living mathematicians, physicists, astronomers, and chemists. It will be published by the firm of J. A. Barth of Leipzig, and revised every two years. S.

Mr. J. R. Hogan and Mr. E. Whitford have been appointed tutors in mathematics at the College of the City of New York. S.

The medal of the Royal Society of London was awarded to Professor W. Burnside for his researches on the theory of groups. S.

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## BOOKS.

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*A College Algebra.* Seventh Edition. By J. M. Taylor, A. M., LL. D., Professor of Mathematics in Colgate University. Boston and Chicago: Allyn and Bacon. 363 pages.

To the introductory work, covering the ground of a high school course, the author devotes the first hundred pages, the remainder of the book being devoted to subjects adapted to the first year at college. In Chapter XII the fundamental notion of *functionality* is introduced and briefly illustrated by means of simple examples. In this chapter the theory of limits is also developed.

One of the chief merits of the book consists, in the opinion of the reviewer, of the introduction of the chapter on the derivatives of algebraic functions. The chapter on the development of functions in series, on convergency and divergency, logarithms and theory

of equations, are written in Dr. Taylor's inimitable style. Chapter XVII on compound interest and annuities, however, treats the latter subject in the brief manner of most algebras, the annuities there considered are *annuities certain* and not *contingent annuities based upon a mortality table*. S. E.

*The Essentials of Algebra.* For Secondary Schools. By Robert J. Aley, Ph. D., and David R. Rothrock, Ph. D., Professors in the University of Indiana. Silver, Burdett & Co. 1904. 295 + vii pages.

It was to be expected that as soon as the laboratory method of teaching mathematics had been sufficiently developed, text-books adapted to this form of instruction would make their appearance. The present book is the first of this kind, and is exceedingly well adapted to laboratory courses in secondary schools. As might be expected under the circumstances, the striking feature is the concreteness with which the subject is treated, principally through the chapters on graphic methods. Some of the most commendable characteristics of the book are the frequency with which diagrams are introduced, the explanation of Pascal's Triangle in connection with the binomial theorem, and Argand's representation of  $i = \sqrt{-1}$ .

The value of the book is enhanced and the pages rendered attractive to the eye by an excellent index, illustrative solutions of problems, and the frequent use of three different kinds of type.

In the opinion of the reviewer, the words "variable" and "constant" (p. 15, *et seq*) in the sense used are unfortunate; the words "unknown" and "parameter" being more suitable for the purpose. As the text explains (p. 205)  $i = \sqrt{-1}$  may be interpreted as the unit on the axis at right angles to the axis of reals. Therefore, the term "imaginary" while sanctioned by usage and history, is undesirable.  $i$  is best regarded as the special complex number  $a + bi$ , where  $a = 0$ ,  $b = 1$ .

The authors enunciate without proof the theorem that the graph of a linear equation in two variables is a straight line,—probably with the idea that this proof should be delayed to a later period in the course, and that the young student feels intuitively convinced of their truth after having constructed the graphs of several such equations.

We are indebted to the authors for an excellent text-book which combines the merits of the older texts with the recent advances in the pedagogy of mathematics.

CHICAGO, March, 1905.

ALMA E. KLUNDER.

*Elements of Mechanics.* Forty Lessons for Beginners in Engineering. By Mansfield Merriman, Professor of Civil Engineering in Lehigh University. 12mo, 172 pages, 142 figures. Cloth, \$1.00 net. New York: John Wiley & Sons.

The aim of this volume is the application of the best methods of applied mechanics to the development of the fundamental principles and methods of rational mechanics.

"To this end, constant appeals are made to experience, by which alone the laws of mechanics can be established, numerous numerical problems are stated as exercises for the student, and a system of units is employed with which every boy is acquainted." *Preface.* The book is one that will be useful in establishing the fundamental principles of theoretical and practical mechanics.

B. F. F.